Attorney Docket No. 2001P16038WOUS

UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Frank Joerdens et al
Application Number:	10/824,233
Filing Date:	04/14/2004
Group Art Unit:	1754
Examiner:	Paul A. Wartalowicz
Title:	CATALYTIC COATING FOR THE SELF-CLEANING OF OVENS AND STOVES

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Commissioner for Patents
P.O. Box 1450
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APPEAL BRIEF

Pursuant to 37 CFR 1.192, Appellant hereby files an appeal brief in the above-identified application. This Appeal Brief is accompanied by the requisite fee set forth in 37 CFR 1.17(f).

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(1) REAL PARTY IN INTEREST

The real party in interest is BSH Bosch und Siemens Hausgeraete GmbH.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 13-17, 19-25, 27-30 and 32-38 are pending in the application and have been finally rejected. The final rejection of claims 13-17, 19-25, 27-30 and 32-38 is being appealed.

(4) STATUS OF AMENDMENTS

In response to the Final Rejection dated November 24, 2006, a Response was filed on April 26, 2007. A Notice of Appeal was received in the US Patent Office on April 26, 2007. An Advisory Action was mailed on May 24, 2007. No further Amendments have been filed subsequent to the Final Rejection.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

CLAIM 13

Independent claim 13 of the present application recites a cooking, roasting, baking or grilling device having a substrate with a self-cleaning coating thereon. The coating includes a plurality of particles having first pores therein, wherein spaces between adjacent particles form second pores which allow for solids and

liquids to enter therein. The present invention also includes a binder for binding the particles together at contacts points. The binder is a colloidal solution comprising one of an inorganic polymer and an inorganic sol, wherein the colloidal solution is formed with at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, and B_2O_3.

CLAIM 32

According to independent claim 32, and as seen in Fig. 1, a cooking device having a substrate with a self-cleaning coating thereon which enables remnants of foodstuffs to be removed without mechanical action includes the coating having a structure formed from a plurality of porous particles having pores therein and an inorganic binder being temperature resistant up to about 500 degrees C, wherein the inorganic binder includes an inorganic colloidal solution having ZrO_2 particles in liquid phase.

CLAIM 37

Independent claim 37 is directed to a substrate with a self-cleaning coating thereon. The present coating includes a plurality of particles having first pores therein, with the particles comprising at least one of a metal oxide, a carbide, and a nitride. Spaces between adjacent particles form second pores which are larger than the first pores such that the first pores prevent a solid or liquid from entering therein, while the second pores allow for solids and liquids to enter therein. Also included is a binder for binding the particles together at contacts points, wherein the binder is formed with at least one of a metal oxide, a carbide, and a nitride.

CLAIM 38

According to independent claim 38, the present invention is directed to a substrate with a self-cleaning coating thereon, with the coating including a plurality of particles having first pores therein. The particles comprise at least one of a metal oxide, a carbide, and a nitride, wherein spaces between adjacent particles

form second pores. Also included is a binder for binding the particles together at contacts points, wherein the binder forms a membrane surrounding the particles. The binder is formed with at least one of a metal oxide, a carbide, and a nitride. Further, the binder forms third pores which are smaller than the second pores such that the third pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein.

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

a. Whether claims 13 and 33-38 are unpatentable under 35 U.S.C. § 112, first paragraph as being indefinite as failing to comply with the written description requirement?

b. Whether claims 13-17, 23-25, 28-30, and 33-37 are unpatentable under 35 U.S.C. § 103(a) over US Patent No. 3,888,790 to Chay in view of US Patent No. 6,517,899 to Hoke et al.?

c. Whether claims 13-25, 17, 20-25, and 32-34 are unpatentable under either 35 USC §102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,993,597 to Stiles in view of US Patent No. 6,517,899 to Hoke et al. and US Patent No. 5, 051, 585 to Watanabe?

d. Whether claims 19 and 27 are unpatentable under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,888,790 to Chay in view of US Patent No. 6,517,899 to Hoke et al.?

e. Whether claims 16, 19 and 27-30 are unpatentable under either 35 USC §102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,993,597 to

Stiles in view of US Patent No. 6,517,899 to Hoke et al. and US Patent No. 5, 051, 585 to Watanabe?

(7) ARGUMENT

a. Whether claims 13 and 33-38 are unpatentable under 35 U.S.C. § 112, first paragraph as being indefinite as failing to comply with the written description requirement?

Regarding the outstanding rejection based on 35 USC §112, first paragraph, the Applicant respectfully refers the Board to the following paragraphs of published application No. US 2005/0006436A1. Regarding Claim 13, reference may be had to paragraphs 0016, 0018 and 0019 for plurality of particles and having first pores therein wherein spaces between adjacent particles form second pores which allow for solids and liquids to enter therein. Reference may be had to paragraph 0016 for support of a binder for binding the particles together at contact points. Reference may be had to paragraphs 0023 and 0026 for the binder being a solution comprising one of an inorganic polymer and inorganic salt wherein the solution is formed with at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, and B_2O_3. Accordingly, claim 13 is fully supported by the specification.

Regarding Claim 33, reference may be had to paragraph 0026. Regarding Claim 34, reference may be had to paragraph 0016. Regarding Claim 35, reference may be had to paragraph 0016. Regarding Claim 36, reference may be had to paragraph 0013. Each of the foregoing dependent claims 33-36 recite one element so there is no need to catalog the elements and where they may be found for the dependent claims.

With respect to Independent Claim 37, reference may be had to paragraph 0017 regarding a plurality of particles having first pores therein with the particles comprising at least one of a metal oxide, a carbide, and a nitride. Reference may be had to paragraph 0016 for spaces between adjacent particles forming second pores which are larger than the first pores such that the first pores prevent a solid or liquid entering therein. Reference may be had to paragraph 0019 for the second pores allowing for solids and liquids to enter therein. Reference may be had to paragraph 0023 for a binder for binding the particles together at contact points wherein the binder is formed with at least one of a metal oxide, a carbide, and nitride.

Regarding Claim 38, reference may be had to paragraph 0017 as applied to claim 37 above. Reference may be had to paragraph 0023 for a binder for binding the particles together at contact points wherein the binder forms a membrane surrounding the particles, wherein the binder is formed with at least one of a metal oxide, carbide and a nitride. Reference may be had to paragraph 0036 for the binder forming third pores which are smaller than the second pores such at the third pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein.

As seen from the foregoing, the language of Claims 13 and 33-38 is fully supported by the specification of the present application and is therefore respectfully requested that the outstanding rejection of those claims based on 35USC Section 112, first paragraph, be reversed.

b. Whether claims 13-17, 23-25, 28-30, and 33-37 are unpatentable under 35 U.S.C. § 103(a) over US Patent No. 3,888,790 to Chay in view of US Patent No. 6,517,899 to Hoke et al.?

The thermal decomposition and thereby the self-cleaning power of conventional coatings of parts on or in cooking, roasting, baking, and grilling devices is limited, because the remnants of foodstuffs in the solid phase do not come in contact with sufficient amounts of oxygen which is required for the decomposition of the soils. To solve this problem, Applicants have discovered that by providing layers with structures into which the soils can enter into and spread out and by providing means by which the soils can receive oxygen, the soils are able to decompose, resulting in a longer lasting coating.

Independent Claim 13 recites a cooking, roasting, baking or grilling device having a substrate with a self-cleaning coating thereon. The coating includes a plurality of particles having first pores therein, wherein spaces between adjacent particles form second pores which allow for solids and liquids to enter therein; and a binder for binding said particles together at contacts points wherein the binder is a colloidal solution comprising one of an inorganic polymer and an inorganic sol, wherein the colloidal solution is formed with at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, and B_2O_3.

The prior art, particularly Chay '790 and Stiles '597, does not disclose, among other things, a binder which is "a colloidal solution comprising one of an inorganic polymer and an inorganic sol, wherein said colloidal solution is formed with at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, and B_2O_3" as recited in Claim 13. Chay '790 and Stiles '597 instead have binders which are formed without the use of an inorganic polymer or an inorganic sol. Additionally, both Chay '790 and Stiles '597 are silent with respect to forming second pores which allow for solids and liquids to enter therein. Moreover, while Chay '790 discusses forming ceramic catalysts having high porosity, Chay '790 is silent with respect to the size of the porosity and specifically with whether said pores prevent a solid or liquid

from entering therein. Moreover the combination of both having pores in particles which prevent a solid or liquid from entering therein and pores formed by spaces between adjacent particles which allow for solids and liquids to enter therein is not at all taught by any of the cited references.

Independent Claim 32 recites a cooking device having a substrate with a self-cleaning coating thereon which enables remnants of foodstuffs to be removed without mechanical action, with the coating having a structure formed from a plurality of porous particles having pores therein and an inorganic binder being temperature resistant up to about 500° C, wherein the inorganic binder includes an inorganic colloidal solution having ZrO_2 particles in liquid phase.

The prior art, particularly Stiles '597, Hoke '899 and Watanabe '185, do not disclose a substrate with a self-cleaning coating thereon as recited in Claim 32. More specifically, the prior art does not disclose, among other things, the coating having a structure formed from a plurality of porous particles having pores therein and an inorganic binder being temperature resistant up to about 500 degrees C, wherein the inorganic binder includes an inorganic colloidal solution having ZrO_2 particles in liquid phase. Therefore, Applicants respectfully request allowance of independent Claim 32.

Independent Claim 37 recites a substrate with a self-cleaning coating thereon. The coating includes a plurality of particles having first pores therein, the particles comprising at least one of a metal oxide, a carbide, and a nitride, wherein spaces between adjacent particles form second pores which are larger than the first pores such that the first pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein; and a binder for binding the particles together at contacts points, wherein the binder is formed with at least one of a metal oxide, a carbide, and a nitride.

The prior art, particularly Chay '790 and Stiles '597, does not disclose a substrate with a self-cleaning coating thereon as recited in Claim 37. More specifically, the prior art does not disclose, among other things, the coating having particles having first pores therein, wherein spaces between adjacent particles form second pores which are larger than the first pores such that the first pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein. Therefore, Applicants respectfully request allowance of independent Claim 37.

Independent Claim 38 also recites a substrate with a self-cleaning coating thereon. According to Independent Claim 38, the coating includes a plurality of particles having first pores therein, with the particles comprising at least one of a metal oxide, a carbide, and a nitride, wherein spaces between adjacent particles form second pores; and a binder for binding said particles together at contacts points, wherein the binder forms a membrane surrounding the particles, wherein the binder is formed with at least one of a metal oxide, a carbide, and a nitride, and wherein the binder forms third pores which are smaller than the second pores such that the third pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein.

It should be noted that Chay '790 and Hoke '899, as well as Chay '790 and Watanabe '185 are improperly combined, and in any event, any combination thereof does not result in the present invention. Hoke '899 is directed to a process for coating a truck radiator that reduces pollution (Col. 1, lines 18-22). Although including a binder, there is no indication that the Hoke coating would withstand temperatures in excess of 500° C. Figures 10-14 of Hoke '899 indicate performance to 100 degrees C while Figure 15 indicates performance to 130

degrees C. Further, the Hoke binders are gas permeable (Col. 2, lines 5-6) and not necessarily permeable to liquids and solids.

As cited in the Official Action, the Hoke coatings can be used as a primary binder precursor and high temperature paints, for example, for mufflers and smoke stacks. Nevertheless, mufflers and smoke stacks are not going to achieve temperatures of 500° C under normal usage conditions. Further, while Hoke '899 refers to a completely inorganic network of Si-O-Si chains and a pigment binder, it is applied as a water-based silicone polymer emulsion. As applied, it is not an inorganic polymer. Therefore, the combination of Hoke '899 and Chay '790 as well as the combination of Hoke '899 and Stiles '597 is improper. It is therefore respectfully requested that the outstanding rejections of the claims based on any combination of Chay '790 and Hoke '899 is in error and should be reversed°.

c. Whether claims 13-25, 17, 20-25, and 32-34 are unpatentable under either 35 USC §102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,993,597 to Stiles in view of US Patent No. 6,517,899 to Hoke et al. and US Patent No. 5, 051, 585 to Watanabe?

Chay '790 and Hoke '899, as well as Chay '790 and Watanabe '185 are improperly combined, and in any event, any combination thereof does not result in the present invention. Further, none of the cited references anticipate claims 13-25, 17, 20-25, and 32-34. Hoke '899 is directed to a process for coating a truck radiator that reduces pollution (Col. 1, lines 18-22). Although including a binder, there is no indication that the Hoke coating would withstand temperatures in excess of 500° C. Figures 10-14 of Hoke '899 indicate performance to 100° C while Figure 15 indicates performance to 130° C. Further, the Hoke binders are gas permeable (Col. 2, lines 5-6) and not necessarily permeable to liquids and solids.

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Further, claims 13-25, 17, 20-25, and 32-34 are dependent claims dependent on base claims which have been demonstrated to be in condition for allowance. Accordingly claims 13-25, 17, 20-25, and 32-34 should be considered allowable as well.

d. Whether claims 19 and 27 are unpatentable under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,888,790 to Chay in view of US Patent No. 6,517,899 to Hoke et al.?

As stated above, Chay '790 and Hoke '899 are improperly combined, and in any event, any combination thereof does not result in the present invention. Further, none of the cited references anticipate claims 19 and 27. Hoke '899 is directed to a process for coating a truck radiator that reduces pollution (Col. 1, lines 18-22). Although including a binder, there is no indication that the Hoke coating would withstand temperatures in excess of 500 degrees C. Figures 10-14 of Hoke '899 indicate performance to 100 degrees C while Figure 15 indicates

performance to 130 degrees C. Further, the Hoke binders are gas permeable (Col. 2, lines 5-6) and not necessarily permeable to liquids and solids.

Further, claims 19 and 27 are dependent claims dependent on base claims which have been demonstrated to be in condition for allowance. Accordingly claims 19 and 27 should be considered allowable as well.

e. Whether claims 16, 19 and 27-30 are unpatentable under either 35 USC §102(b) or 35 U.S.C. § 103(a) over US Patent No. 3,993,597 to Stiles in view of US Patent No. 6,517,899 to Hoke et al. and US Patent No. 5,051,585 to Watanabe?

Stiles '597 and Hoke '899, as well as Stiles '597 and Watanabe '185 are improperly combined, and in any event, any combination thereof does not result in the present invention. The Official Action asserts that Watanabe '185 teaches that it is known for particles that are water-insoluble with the pore size of the particles being less than 50,000 angstroms. Watanabe '185 is directed to an adsorbent of β_2-microglobulin in blood. Watanabe notes that the water-soluble particulate carrier may be porous in order to increase adsorption efficiency. It is desirable that the β_2-microglobulin enters deep into the pores of the porous particles. To this effect, the porous particles preferably have an average pore size ranging from 20 angstroms to 5,000 angstroms (Col. 9, lines 23-41).

The Official Action's generalizations of the teachings of Watanabe '185 ignore the differences in the respective scientific fields of Chay '790 and Stiles '597 patents and that of the Watanabe '185. There is no applicability of a particular carrier designed to take β_2-microglobulin deep into the pores of the porous particles and that of the current binder. Accordingly, Watanabe '185 has no

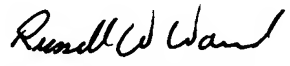
application to the current field of endeavor and is, therefore, improperly combined with either Chay '790, Hoke '599, or Stiles '597. It is therefore respectfully requested that any rejections of the claims based on any combination of references with Watanabe '185 be reversed.

Further, claims 16, 19 and 27-30 are dependent claims dependent on base claims which have been demonstrated to be in condition for allowance. Accordingly claims 16, 19 and 27-30 should be considered allowable as well.

(8) CONCLUSION

In view of the foregoing discussion, it is respectfully requested that the Honorable Board of Patent Appeals and Interferences overrule the final rejection of Claims 13-17, 19-25, 27-30 and 32-38 over the cited art, and hold that the Appellant's claim be allowable over such art.

Respectfully submitted,



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CLAIMS APPENDIX

Claims 1-12 (Canceled)

13. A cooking, roasting, baking or grilling device having a substrate with a self-cleaning coating thereon, said coating comprising:

a plurality of particles having first pores therein, wherein spaces between adjacent particles form second pores which allow for solids and liquids to enter therein; and

a binder for binding said particles together at contacts points;

wherein said binder is a colloidal solution comprising one of an inorganic polymer and an inorganic sol, wherein said colloidal solution is formed with at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, and B_2O_3.

14. The device according to claim 13, wherein said porous particles are thermally and chemically stable porous metal oxides, carbides or nitrides.

15. The device according to claim 13, wherein said porous particles are at least one of SiO_2, TiO_2, Al_2O_3, ZrO_2, SiC, Si_3N_4, C and B_2O_3.

16. The device according to claim 13, wherein said porous particles have a diameter in the range of 5 to 100 microns.

17. The device according to claim 13, wherein said porous particles have open-cell pores.

18. (Canceled)

19. The device according to claim 13, wherein said binder comprises particles having a diameter in the range of 0.5 to 10 microns.

20. The device according to claim 13, wherein said coating includes addition particles that function to at least one of, reduce the roughness of the coating, improve the binding between said porous particles, improve the binding between said coating and the substrate, adjust the color of said coating, or improve the thermal decomposition, the haptics or the spreading ability of said coating.

21. The device according to claim 20, wherein said additional particles are at least one of nanoscale particles, particles in the micrometer range, pigment particles, and metals.

22. The device according to claim 21, wherein said additional particles comprise at least one of metal oxides, carbides and nitrides.

23. The device according to claim 13, wherein the part or portion is a part or portion of a baking oven muffle.

24. The device according to claim 13, wherein the part or portion is a part or portion of an oven or a stove.

25. The device according to claim 15, wherein said porous particles are at least one of Al_2O_3 and SiO_2.

26. (Canceled)

27. The device according to claim 19, wherein said particles have a diameter of about 1 to 5 microns.

28. The device according to claim 16, wherein said diameter is about 10 to 80 microns.

. The device according to claim 16, wherein said diameter is about 20 to 60 microns.

30. The device according to claim 16, wherein said diameter is about 30 to 50 microns.

31. (Canceled)

32. A cooking device having a substrate with a self-cleaning coating thereon which enables remnants of foodstuffs to be removed without mechanical action, comprising:

the coating having a structure formed from a plurality of porous particles having pores therein and an inorganic binder being temperature resistant up to about 500 degrees C, wherein said inorganic binder includes an inorganic colloidal solution having ZrO_2 particles in liquid phase.

33. The device according to claim 13, wherein said inorganic polymer is one of a silicone resin and a polymeric phosphate.

34. The device according to claim 13, wherein said first pores are less than 1 μm in diameter in order to prevent a solid or liquid from entering therein.

35. The device according to claim 13, wherein said binder forms a membrane surrounding said particles, and said membrane includes pores which are small enough to prevent a solid or liquid from entering therein.

36. The device according to claim 35, wherein said binder is temperature resistant up to about 500 degrees C.

37. A substrate with a self-cleaning coating thereon, said coating comprising:

a plurality of particles having first pores therein, the particles comprising at least one of a metal oxide, a carbide, and a nitride, wherein spaces between adjacent particles form second pores which are larger than the first pores such that the first pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein; and

a binder for binding said particles together at contacts points, wherein said binder is formed with at least one of a metal oxide, a carbide, and a nitride.

38. A substrate with a self-cleaning coating thereon, said coating comprising:

a plurality of particles having first pores therein, the particles comprising at least one of a metal oxide, a carbide, and a nitride, wherein spaces between adjacent particles form second pores; and

a binder for binding said particles together at contacts points, wherein said binder forms a membrane surrounding said particles, wherein said binder is formed with at least one of a metal oxide, a carbide, and a nitride, and wherein said binder forms third pores which are smaller than the second pores such that the third pores prevent a solid or liquid from entering therein and the second pores allow for solids and liquids to enter therein.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None